



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,324	10/07/2003	Chi Florence Lao	1857.2110000	2673
26111 7590 03/17/2009 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005				
EXAMINER				
WHITESSELL GORDON, STEVEN H				
ART UNIT		PAPER NUMBER		
2851				
MAIL DATE		DELIVERY MODE		
03/17/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/679,324

Applicant(s)

LUO ET AL.

Examiner

Steven Hunt Whitesell-Gordon

Art Unit

2851

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 23-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-17, 26-28 and 31-33 is/are allowed.
- 6) ☒ Claim(s) 1-13, 23-25 and 30 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Acknowledgment is made of Amendment made 17 December 2008. Claims 18-22 is cancelled and claims 1, 14, 26, 30 and 31 are currently amended.

Claim Objections

2. Claim 7 is objected to because of the following informalities:

Re claim 7, lines 6 and 7: "one permeable side" and "other permeable side" should be rewritten as --one impermeable side-- and --other impermeable side--, respectively, because these are recited as sides of a second pair.

For purposes of examining, it is understood that the sides that form the second pair of opposing sides are impermeable to gas.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 6, 7, 9-13, 23 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakano [US 2002/0057425].

For claim 1, Nakano teaches a purge device for actively purging a pellicle volume (volume between pellicle 24 and reticle 23, see Fig. 4) enclosed within a reticle-

pellicle assembly (23 and 24), the reticle-pellicle assembly having a reticle (23) with a bottom portion, a pellicle (24), and a gas permeable pellicle frame (pellicle frame 25 that bonds pellicle 24 to reticle 23 with ports a and b, see [0061] and Fig. 16), the gas permeable pellicle frame supporting the pellicle at a standoff from the reticle (see separation in Fig. 4), the purge device comprising: a base (supports 28) having a purge input interface (29) and a cavity (space between supports 28), wherein said cavity is configured to receive at least a portion of the reticle-pellicle assembly including a pellicle and the enclosed pellicle volume such that a first region (space in vicinity of nozzle 29) within the cavity is formed at the purge input interface, a second region (space in vicinity of discharge nozzle 37) within the cavity is formed at a permeable side of the pellicle frame away from the first region, and a gap region (chamber 36) is formed between the pellicle and a surface of the cavity, and purging gas (inert gas, see [0077]) sent through the purge input interface is kept at a higher pressure (positive in relation chamber 36, see [0078]) in the first region relative to the second region (negative in relation to chamber 36, see [0078]) such that the purging gas flows through the enclosed pellicle volume and said gap region (see [0077]), whereby, a displacement force on the pellicle due to a pressure difference between purging gas in the enclosed volume and purging gas in the gap region is within a tolerance range of the pellicle (see [0078]); and wherein only a part of the bottom portion of the reticle is within the purge device (space of reticle between supports 28).

For claim 2, Nakano teaches the base includes at least one support member (supports 28) that supports the reticle-pellicle assembly.

For claim 3, Nakano teaches the base includes at least one holding member (28) that holds (see [0060]) the reticle-pellicle assembly onto the base.

For claim 4, Nakano teaches a support member with a vacuum groove (see [0060]).

For claim 6, Nakano teaches the pellicle frame includes at least two sides permeable to gas arranged within said cavity such that at least one permeable side faces the first region (frame adjacent to 29) and another permeable side faces the second region (frame adjacent to 37).

For claim 7, Nakano teaches the pellicle frame comprises: a first pair of opposing sides (side walls shown in Fig. 5 containing ports 1a and b) permeable to gas and arranged within said cavity such that one permeable side (side adjacent to 29) of said first pair faces the first region and the other permeable side (side adjacent to 29 of said first pair faces the second region; and a second pair of opposing sides (side walls not containing ports a and b at top and bottom of Fig. 5) impermeable to gas (25 contains gas, see [0018] and Fig. 5) and arranged within said cavity such that one impermeable side of said second pair faces a first cavity wall between the first region and the second region and the other impermeable side of said second pair faces a second cavity wall between the first region and the second region opposite said first cavity wall (see Fig. 5).

For claim 9, Nakano teaches the purge input interface (29) includes at least one port for passing the purging gas to the first region (opening at 29).

For claim 10, Nakano teaches a purge output interface (37) having at least one port for passing exhaust out of the purge device (opening at 37).

For claim 11, Nakano teaches the cavity comprises a rectangular volume within said base (see rectangle shape by connected support 28 in Figure 5).

For claim 12, Nakano teaches the first region is substantially enclosed by a permeable side of the pellicle frame, the purge input interface, a surface of the reticle, a top surface of the base, and side walls of the cavity (see Figs. 4 and 5).

For claim 13, Nakano teaches a flow barrier (wall surround input port a) that keeps the flow of the purging gas within the first region before entering the pellicle volume.

For claim 23, Nakano teaches another flow barrier (wall surrounding output port b) that seals the flow of the purging gas within the second region as it exits the pellicle volume and prevents inflows, whereby, the second region can be kept at a very low pressure when coupled to vacuum (negative pressure, see [0078]).

For claim 30, Nakano teaches a purge device for actively purging a pellicle volume (pellicle space between pellicle 24 and reticle 23, see Fig. 4) enclosed within a reticle-pellicle assembly (23 and 24), the reticle-pellicle assembly having a reticle (23, a pellicle, and a gas permeable pellicle frame (pellicle frame 25 that bonds pellicle 24 to reticle 23 with ports a and b, see [0061] and Fig. 16), the gas permeable pellicle frame supporting the pellicle at a standoff from the reticle (separation between 23 and 24), the purge device comprising: a base (28) having a cavity (space between support 28)

formed therein, wherein said cavity receives at least a portion of the reticle-pellicle assembly including a pellicle and the enclosed pellicle volume such that a first region (see [0078]) within the cavity is formed, said first region being capable of holding a purging gas at a high pressure (higher than space 36); and a flow barrier (ports a and b, surrounding pellicle frame and pressure maintain at 29 and 37 all act to influence pressure) that keeps the flow of the purging gas within the first region at a high pressure as it enters the enclosed pellicle volume (see [0078]), wherein only a part of a bottom portion of the reticle is within the purge device (space of reticle between supports 28).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano.

For claim 5, Embodiment 4 of Nakano teaches a the pellicle frame permeable to an inert gas via ports a and b (see Fig. 4 and [0077]), but does not explicitly show in Fig. 4 that the pellicle frame is impermeable to particles.

Nakano teaches in [0018] that a dust removing filter is disposed on a vent passage in order to reduce dust entering the pellicle space.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate the impermeable of the pellicle taught by Nakano in [0018] in the pellicle frame taught by Nakano in Embodiment 4, because this would reduce the likelihood of the dust entering the pellicle space and adhering to the surface of the pellicle and reticle, degrading the exposure by causing scattered light.

For claim 8, Embodiment 4 of Nakano teaches providing an inert gas to the pellicle space, but does not explicitly disclose nitrogen.

Nakano teaches in [0010] that nitrogen in an inert gas used in purging.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate the purging gas includes nitrogen as taught by Nakano in [0010] in the pellicle frame is permeable to inert gas as taught by Nakano in Embodiment 4, because as taught by Nakano in [0009]-[0011], nitrogen can purge remaining oxygen in the pellicle space that would generate ozone when using ultraviolet lasers, thereby reducing the ozone adhesion to the surface of the reticle and pellicle.

7. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano in view of Kamono [US 2003/0150329].

For claims 24 and 25, Nakano teaches a purge device for actively purging a pellicle volume with a base having a cavity, but does not explicitly teach at least one plate within the cavity of said base and extending parallel with the pellicle such that said gap region is formed between a surface of said at least one plate and said pellicle,

wherein said at least one plate includes a pressure balancing plate having a set of holes.

Kamono teaches at least one plate 28a within the cavity 39 of said base 36 and extending parallel with the pellicle 24 such that said gap region (space between plate 28a and pellicle 24, see Fig. 9A) is formed between a surface of said at least one plate 28a and said pellicle 24, wherein said at least one plate 28a includes a pressure balancing plate 28a having a set of holes (perforated, see Fig. 9A and [0074]).

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate the perforated plate as taught by Kamono in the purge device taught by Nakano, because the perforated plate could allow for providing a uniform gas over the surface of the pellicle, in order to maintain the flatness of the pellicle and reduce sag.

Allowable Subject Matter

8. Claims 14-17, 26-28 and 31-33 are allowed.
9. Claim 29 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter: Neither Aoki, Nakano nor Kamono explicitly disclose the particulars of:

For claims 14 and 31, a purge device for actively purging a pellicle volume comprising; a flow barrier that keeps the flow of the purging gas within the first region

before entering the pellicle volume, wherein said flow barrier comprises a non-contacting gas barrier.

For claim 26, at least one plate within the cavity of said base and extending parallel with the pellicle such that said gap region is formed between a surface of said at least one plate and said pellicle, wherein said at least one plate includes a pressure balancing plate having a set of holes, wherein said base includes one or more dividing walls that extend within said cavity,

For claim 29, a base having one or more support members having an adjustable height that extends within said cavity, to form a first plenum below said set of holes in said pressure balancing plate.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

11. Applicant's arguments with respect to claims 1-13, 23-25 and 30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Hunt Whitesell-Gordon whose telephone number is (571)270-3942. The examiner can normally be reached on Monday to Thursday, 9:00 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. H. W./
Examiner, Art Unit 2851

/Diane I Lee/
Supervisory Patent Examiner, Art Unit 2851